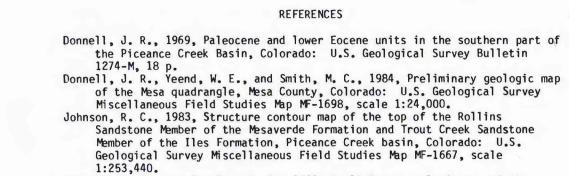
MISCELLANEOUS FIELD STUDIES MAP MF-1784



Younger alluvial terrace gravels--About 20-80 ft (6-24

Middle alluvial terrace gravels--About 40-200 ft

Older alluvial terrace gravels--Intertongue with

till (Qgt) in till plains on the lower slopes of

Grand Mesa. About 50-200 ft (15-60 m) above streams Pediment gravel, undifferentiated--Pebbles, cobbles,

and boulders of locally derived angular sandstone,

poorly stratified to unstratified light-greenish-

siltstone, claystone, and marlstone, in a matrix of

gray silty sand. Basalt detritus scarce. Probably

includes some colluvial material. Commonly mantled

with reddish-brown eolian silt. About 5-40 ft

DEPOSITS OF PRE-BULL LAKE(?) GLACIATIONS (PLEISTOCENE)

greenish-gray sandy silt. May include some till.

Basalt boulders as much as 5 ft (1.5 m) in maximum

dimension, and sandstone, marlstone, and claystone slabs as much as 1 ft (0.3 m) in length are

common. Occurs high above present streams and has

Terrace and fan gravel -- A mixture of nearly equal

amounts of rounded basalt boulders and slabs of locally derived sandstone, claystone, and marlstone in a matrix of light-greenish-gray silty sand. Reddish-brown windblown sand and silt mantle terrace

Younger terrace and fan gravel--Maximum thickness

Middle terrace and fan gravel--Maximum thickness

Older alluvial terrace and fan gravel--Maximum

Pediment gravel -- Subangular to subrounded pebble,

cobble, and boulder gravel. Cobbles, pebbles, and matrix are locally derived, poorly sorted grayish-

green sandstone, siltstone, and claystone. Gravel surface is commonly mantled with thin veneer of

Parachute Creek Member--Gray-weathering black, brown,

contains minor amount of gray siltstone. Outcrop of

rich oil shale called the Mahogany bed (m). Crops out only on Nick Peak in southeast part of quadrangle. Upper part eroded. Maximum remaining

Anvil Points Member -- Fine- to coarse-grained, gray and

algal limestone and a few tan low-grade oil-shale

beds. Crops out only on Nick Peak in southeast part

beds of fine- to medium-grained sandstone. Maximum

quadrangle but thickens considerably to the east in

the Collbran quadrangle. Donnell (1969, p. 12) measured detailed reference sections just northwest

Molina Member (Eocene and Paleocene?) -- Gray and brown,

containing pebbles of quartz, quartzite, chert, and

claystone. Some gray and green variably silty

claystone; minor siltstone. Conspicuous ledge-

Molina and described two reference sections in

Molina quadrangle Atwell Gulch Member (Paleocene)--Purple, lavender,

a detailed reference section just northwest of quadrangle in secs. 23 and 26, T. 9 S., R. 97 W. MESAVERDE FORMATION (UPPER CRETACEOUS)

------ CONTACT--Approximately located where obscured by

— U FAULT--Dashed where approximately located. Dotted

 -6^{33} DRY HOLE--0il and gas test. Number keyed to table 1

where covered by surficial deposits. U, upthrown side; D, downthrown side

Sandstone Member of Mesaverde Formation. Contour interval 100 ft (30.5 m). Note:

Plateau

Figure 1.--Extent of gas field in the Molina quadrangle, Colorado

Gas Field

structure is based on regional structure map of Rollins Sandstone Member by R. C. Johnson

soil cover or vegetation

•23 OIL WELL--Number keyed to table 1

GAS WELL--Number keyed to table 1

-1500- STRUCTURE CONTOURS--Drawn on top of Rollins

Molina Quadrangle

Ohio Creek Member--Fine- to coarse-grained, white to

brown sandstone; in most places contains pebbles of quartz, quartzite, chert, and some limestone and

granitic rock. Only upper 80-100 ft (26-30 m) is exposed in quadrangle. Ohio Creek Member has been redefined by Johnson and May (1980) as being a weathering zone below the pre-Tertiary erosion surface. Upper contact is the change from highly weathered white kaolinitic sandstone containing sparse pebbles of composition, as noted above, to brown sandstone containing generally more abundant and larger pebbles of chert and red and gray sandstone of the Wasatch. Unit as mapped may locally include some basal Tertiary beds

forming unit. Thickness ranges from about 200 ft (60 m) to about 500 ft (150 m). Donnell (1969, p.

3, 15-17) named the member for outcrops near town o

red, and gray claystone, and minor amounts of gray and brown lenticular sandstone and siltstone.

Thickness ranges from about 750 ft (225 m) to about

1.150 ft (345 m). Donnell (1969, p. 13-14) measured

of quadrangle. Type locality is in sec. 19, T. 9 S.,

brown sandstone containing minor amounts of gray siltstone, marlstone, and oolitic, ostracodal, and

Shire Member (Eocene and Paleocene?)--Variegated purple, lavender, gray, and brown claystone; minor

thickness about 500 ft (150 m) in the Molina

fine- to coarse-grained sandstone; a few conglomeratic sandstone and conglomerate beds

of quadrangle. About 700 ft (213 m) thick

and gray oil shale that locally forms cliffs;

reddish-brown windblown sand and silt. About 50 ft

Colluvium--Angular to subangular, poorly sorted boulders, cobbles, and pebbles in a matrix of

m) above streams

(1.5-12 m) thick

surfaces

(15 m) thick

WASATCH FORMATION

GREEN RIVER FORMATION (EOCENE)

about 40 ft (12 m)

about 80 ft (24 m)

thickness about 120 ft (36 m)

thickness about 320 ft (96 m)

irregular topographic form

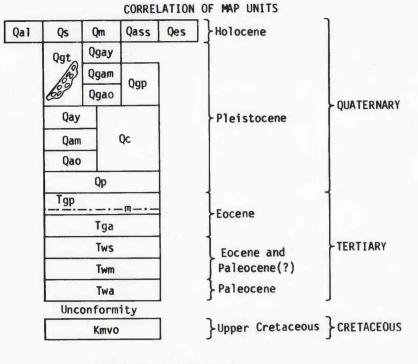
(12-60 m) above streams

Johnson, R. C., and Douglas, B. C., 1980, Preliminary geologic map of the Wagon Track Ridge quadrangle, Garfield and Mesa Counties, Colorado: U.S. Geological Survey Miscellaneous Field Studies Map MF-1182, scale Johnson, R. C., and May, Fred, 1980, A study of the Cretaceous-Tertiary unconformity in the Piceance Creek basin, Colorado--The underlying Ohio Creek Formation (Upper Cretaceous) redefined as a member of the Hunter Canyon or Mesaverde Formation: U.S. Geological Survey Bulletin 1482-B,

Yeend, W. E., 1969, Quaternary geology of the Grand and Battlement Mesa area, Colorado: U.S. Geological Survey Professional Paper 617, 50 p.

Table 1.--Data for Wells drilled for oil and gas in the Molina quadrangle, Colorado

Map No.	Section	Tota Company and Name Feet	1 Depth Meter
		T. 9 S., R. 95 W.	
1	29	Chandler and Assoc., 15-19 Puett 5,296	1,614
		T. 9 S., R. 96 W.	
2	35	Fred W. Pool, 1 Corey	1,487
		T. 10 S., R. 95 W.	
3	5	Chandler and Assoc., 1-5 Walch 4,970	1,515
4	7	Adolph Coors Co., 1-7 Boren 4,126	1,258
5	17	Rocky Mountain Natural Gas, 1-C Hall 5,170	1,576
6	17	Bow Valley Petroleum, 17-2 Wissel 5,323	1,622
7	17	Bow Valley Petroleum, 17-1 Wissel 5,100	1,554
8	18	Apache Corp., 1 Thomas 4,550	1,387
9	18	Flying Diamond Oil Co., 18-1 Thomas 4,598	1,401
10	19	Flying Diamond Oil Co., 19-1 Wallace Currier 4,600	1,402
11	19	Flying Diamond Oil Co., 19-2 Wallace Currier 4,500	1,372
12	19	Flying Diamond Oil Co., 19-3 Wallace Currier 4,500	1,372
13	19	Tenneco, 1 Currier 4,723	1,440
14	30	Flying Diamond Oil Co., 30-3 Milholland 4,593	1,400
15	30	Flying Diamond Oil Co., 30-1 Wallace Currier 4,500	1,37
16	30	Flying Diamond Oil Co., 30-2 Currier 4,775	1,45
17	30	La Cima Corp., 1 Alice E. Reed 4,750 Adolph Coors Co., 1-31 Acco-Nichols et al 4,975	1,44
18	31		
		T. 10 S., R. 96 W.	
19	1	El Paso Natural Gas Co., 1 Rushmmore-Federal 4,940	1,50
20	4	Chandler and Assoc., 2-4 Gunderson	1,37
21	10 11	Gasco Inc., 1 Walker	1,33
23	12	El Paso Natural Gas Co., 1 Skyline-Hittle 4,795	1,46
24	13	Norris Oil Co., 13-3 Finch 4,008	1,22
25	13	Flying Diamond Oil Co., 13-2 Nichols 3,860	1,17
26	13	Apache Corp., 1 Nichols-B	1,20
27	13	Flying Diamond Oil Co., 13-1 Nichols 4,100	1,25
28	14	Norris 0il Co., 14-2 Currier	1,12
29	14	Polumbus Corp., 1 Carl Barnard 3,750	1,14
30	15	Gasco Inc., 1 Gasco-Webb et al	1 03
31	16	Chandler and Assoc., 15-16 Woodring 3,364 Adolph Coors Corp., 1-20 Trahern 3,251	1,02
32 33	20 21	Norris Oil Co., 21-3 Nichols	1,04
34	21	Gasco Inc., 1 Gasco-Nichols et al 7,644	2,33
35	21	Norris Oil Co., 21-2 Federal 3,796	1,19
36	22	Chandler and Assoc., 6-22 Barnard 3,585	1,0
37	23	Hammonds Scott, 23-1 Johnson 3,775	1,1
38	23	Norris Oil Co., 23-2 Plateau Creek 3,865	1,1
39	24	Polumbus Corp., 3 Milholland 4,050	
40	24	La Cima Corp., 1 H. R. Milholland Sr 4,500	
41	24	Flying Diamond Oil Co., 24-1 Milholland 4,402	
42	25	Norris Oil Co., 25-3 Govt	
43	25	La Cima Corp., 2 Milholland 4,390	
44	25	Flying Diamond Oil Co., 25-1 Milholland 4,503	
45	26	Hammonds-Blanco Oil Co., 26-1 Moran-State 3,850 Hammonds-Scott, 27-1 Govt	
46	27 27	Norris Oil Co., 27-2 Moran-Govt	
47 48	28	Apache Corp., 1 U.S. Moran	
49	32	Adolph Coors Co., 1-32 Acco-Wood 4,242	
5 0	33	Hammonds Scott., 33-1 Pickens	
51	35	Mountain Fuel Supply, 1-35 Bull Basin 4,000	



DESCRIPTION OF MAP UNITS

Qam

3 / Qao

Surficial geology mapped by Warren E. Yeend, 1966; bedrock geology mapped by John R. Donnell, 1963-65

Note: The surficial deposits of the Molina quadrangle are included in a detailed paper by Yeend (1969). ALLUVIAL AND FLOODPLAIN DEPOSITS (HOLOCENE) -- Wellrounded boulders, cobbles, and pebbles in a wellsorted matrix of pinkish-gray to grayish-brown fine sand. Clasts are basalt and contain lesser amounts of local sedimentary rocks. Lenses of reddish-brown sandy silt are common

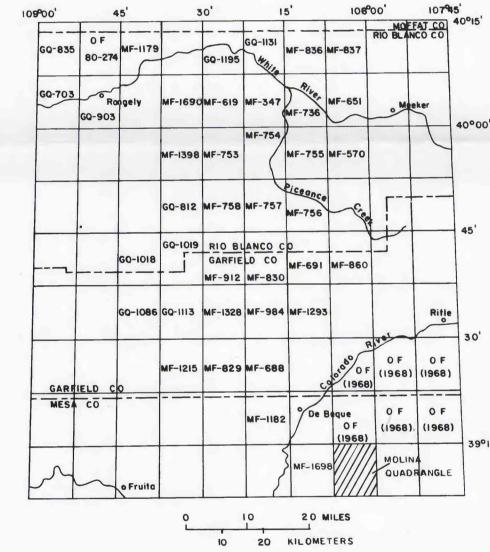
SLUMP, EARTHFLOW, AND LANDSLIDE DEPOSITS (HOLOCENE) --Small slumps developed in Tertiary claystone beds grade downslope into unconsolidated weathered clay in hummocky earthflows having flow ridges. Fresh slide scars common. Vegetation commonly uprooted and tilted. Most deposits are presently active MUDFLOW DEPOSITS (HOLOCENE) -- Angular to subangular boulders, cobbles, and pebbles in a matrix of reddish-brown silty clay, and yellowish-green, brown, and grayish-brown sandy silt; poorly sorted. Contain scattered clay pods. Clasts derived from basalt, sandstone, marlstone, siltstone, and claystone. Surfaces irregular, having small ponds, lobate flow ridges, scars, streamlike form, and few natural levees. Commonly

developed on claystones of the Wasatch Formation. Some deposits presently active ALLUVIAL AND EOLIAN SAND AND SILT (HOLOCENE) --Yellowish-brown silt and sand, reddish-brown silt, generally well sorted. Contains mostly quartz derived from nearby sedimentary rocks. Locally occupies depressions and young valleys. Mapped only where moderately extensive. Maximum thickness about

40 ft (12 m) EARTHFLOW AND SOIL-CREEP DEPOSITS (HOLOCENE)--Poorly sorted boulder, cobble, and pebble gravel in a matrix of greenish-gray sandy silt. Contains some basalt boulders derived from older till and landslide deposits, and angular fragments of sandstone, siltstone, and claystone derived from Wasatch Formation. Surfaces are irregular, crudely terraced, have lobes, swales, and undrained depressions containing local pond deposits. Maximum thickness about 30 ft (9 m) GRAND MESA FORMATION (PLEISTOCENE) -- Pinedale (?)

glaciation -Abundant detritus of angular to subangular pebbles, cobbles, and boulders in a matrix of grayish-brown sand, silt, and clay. Composition of pebbles, cobbles, and boulders 90 percent or more basalt. A few basalt boulders and cobbles are striated, but many are soled and faceted. Coarse basalt fragments within the till show little weathering. Smooth till plains common. Maximum thickness about 150 ft (46 m)
Alluvial terrace gravel--Outwash and alluvial fan deposits consisting of pebbles, cobbles, and boulder gravel of mostly basalt and variable amounts of sedimentary rocks in a sandy matrix; subrounded to

well rounded, local imbricate structure



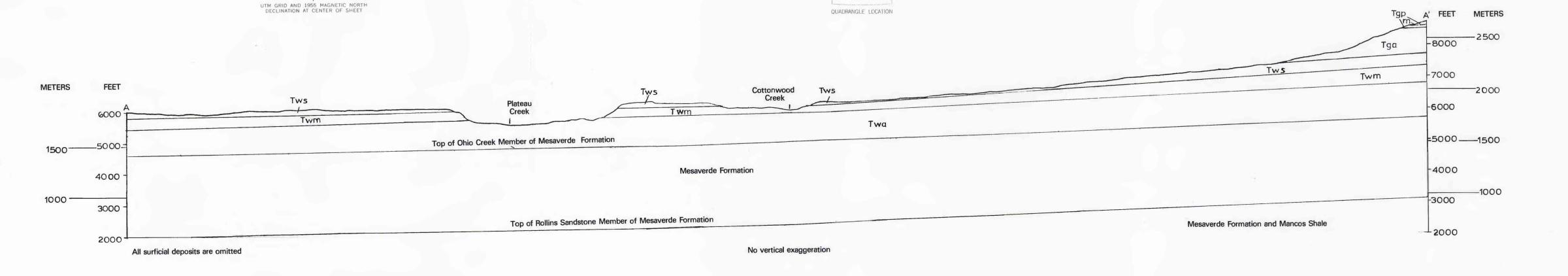
CREEK BASIN AREA, NORTHWESTERN COLORADO

INDEX OF PUBLISHED U.S. GEOLOGICAL SURVEY 7 1/2-MINUTE GEOLOGIC MAPS IN THE PICEANCE

PRELIMINARY GEOLOGIC MAP OF THE MOLINA QUADRANGLE, MESA COUNTY, COLORADO

John R. Donnell, Warren E. Yeend, and Marjorie C. Smith

1985



CONTOUR INTERVAL 40 FEET

COLORADO

DEPARTMENT OF THE INTERIOR

Base from U.S. Geological Survey, 1955

21 Twa

38 agay